

ALAIOPHYLLUM MACKENZIENSE SP. NOV., A DEVONIAN TETRACORAL FROM CANADA

by A. E. H. PEDDER

ABSTRACT. The fauna of the Kee Scarp Formation at the type locality near Norman Wells, Northwest Territories, is reviewed, and its only common tetracoral is described as *Alaiophyllum mackenziense* sp. nov. It is concluded that the fauna is either Givetian or early Frasnian in age.

THE age of the Kee Scarp Formation is not clear from a study of published reports. In 1959 the writer visited the type exposure near Norman Wells, Northwest Territories, and collected, among others, the fossils described below. He is indebted to Triad Oil Co. Ltd., for whom the work was carried out, for permission to publish this paper and to present the type specimens to the Geological Survey of Canada (abbreviated to GSC below).

Fauna and age of the type exposure of the Kee Scarp Formation

When first studied and described (Stelck 1944, pp. 15, 16; in Hume 1945, p. 35) the Kee Scarp Formation was considered to be Upper Devonian. Although this opinion has prevailed with some geologists (Warren and Stelck 1956, p. 11; Storey 1961, p. 499), it has been challenged by others (Crickmay 1957, p. 11; Bassett 1961, pp. 492-4), who regard the Kee Scarp Formation as upper Middle Devonian. Galloway (1960, p. 621) considered it to be lower Upper Devonian, but later (in Collinson 1960, p. 1218) abandoned his earlier opinion and regarded it as upper Middle Devonian. Lenz (1961, table 1) considered the lower part as either uppermost Middle, or lowermost Upper Devonian, and the upper part as very low Upper Devonian.

Bassett (1961) extended the use of the term Kee Scarp to include the Ramparts Limestone of the Fort Good Hope area, because Ramparts as a stratigraphical name is pre-occupied. Unfortunately this obscures the relationship between the two limestones, which are not physically one and the same, since the Kee Scarp is a discrete reef. Determination of its age must be based on the fauna at the type locality and not on those from other localities in limestones subjectively correlated with it.

Warren and Stelck (1956, pl. 15, figs. 25-27) figured a specimen from the type locality as *Indospirifer* sp. The presence of *Adolfia* [= *Indospirifer*] would strongly suggest a middle Frasnian age, but examination of the Kee Scarp specimen's micro-ornament excludes it from that genus. At the present time the specimen does not help resolve the problem of the formation's age.

Lenz (1961, p. 504, pl. 3, figs. 6, 7) compared a coral from the formation with *Macgeea gallica* Lang and Smith, which is a middle Frasnian species. He stated that the Kee Scarp coral has horseshoe dissepiments, but these cannot be seen in the figure of the longitudinal section and in fact the coral resembles that group of Givetian corals which includes '*Aulophyllum*' *richardsoni* Meek and other undescribed species.

Other forms reported in the literature (Warren and Stelck 1956; Crickmay 1957;

Galloway 1960; Lenz 1961) from the type locality are: *Stromatoporella damnoniensis* Nicholson, *Stromatopora* sp. cf. *S. planulata* Hall and Whitfield *sensu* Nicholson, *Clathrocoelona aboena* Yavorsky, *Cladopora?* sp., *Alveolites* sp., *Aulopora* sp. cf. *A. conferta* Winchell, *Trachypora* sp., *Schizophoria* sp., productoid indet., *Atrypa* or *Spinatrypa* sp., ambocoeliinid, and thick-shelled pelecypods. The following were collected at the type locality by the writer (Triad Oil Co. Ltd. collections D107, 108, 135): calcispheres, *Alaiophyllum mackenziense* sp. nov., *Alveolites* sp., *Scoliopora* sp., *Thamnopora* sp., *Idiostroma* sp., *Amphipora ramosa* (Phillips), *Stachyodes* sp., *Hermatostroma* sp., *Spinatrypa* sp., *Straparollus* (*Euomphalus*) sp. and thick-shelled pelecypod fragments.

None of these forms provides a sure index of their age. *Alaiophyllum*, however, although a rare genus, is significant. It was first described from three widely scattered Givetian deposits in Russia and has subsequently been recognized by the writer in the Maligne equivalent and Swan Hills Member of the Beaverhill Lake Formation of Alberta (these Canadian specimens are being described by the writer for publication by the Geological Survey of Canada). The Maligne Formation contains *Timanites*, indicating that it is early Frasnian, and the Swan Hills Member, as shown by its fauna, is also about the same age. The known range of *Alaiophyllum*, therefore, is Givetian to early Frasnian and it may be concluded that the age of the Kee Scarp reef also falls within these limits.

SYSTEMATIC DESCRIPTION

Family STAUROIIDAE Edwards and Haime 1850, *sensu lato*

Genus ALAIOPHYLLUM Goryanov 1961

Type species (original designation). *Alaiophyllum jarushevskyi* Goryanov 1961, pp. 71–73, pl. 8, figs. 1a–3d. Givetian stage, Boord Ridge, southern Ferghana, U.S.S.R.

Remarks. Goryanov referred the genus doubtfully to the Phillipsastraeidae. However, the poorly and variably developed dissepimentarium and thick stereozone appear to relate *Alaiophyllum* more closely to the Stauriidae.

Alaiophyllum mackenziense sp. nov.

Plate 19, figs. 1–6

Name derivation. Mackenzie River, Northwest Territories, Canada.

Types. Holotype and paratypes 1 and 2 are GSC 16850–2 respectively.

Type stratum. Kee Scarp Formation—the lower 140 feet which are exposed.

Type locality. Kee Scarp, 6 miles ENE. of Norman Wells, Northwest Territories, Canada.

Description. Compound tetracoral with loosely fasciculate corallum and gently sinuous subcylindrical corallites. Calice and exterior surface not exposed in the types. All the specimens collected at the type locality were tightly embedded in matrix and corallites were not obviously parts of particular colonies; thus the size of the entire corallum is unknown.

Transverse sections of individual corallites circular, or nearly so, with diameters of up to 14.0 mm., generally about 12.5 mm.; adjacent corallites touching or up to 30.0 mm. apart. Epitheca smooth, commonly enveloped by stromatoporoids, reinforced by a

prominent peripheral stereozone, normally about 1.0 mm. thick but as much as 3.0 mm. thick in parts of some corallites. Stereozone composed of dilated septal ends and lamellar tissue. In some sections inner less-prominent stereozones are formed by sclerenchyme deposited on the dissepiments. Septa roughly radially arranged, differentiated in two orders and of such variable length that some minor septa are as long as major ones. Major septa number 20 to 25 in corallites with diameters of 10.0 to 14.0 mm., but not necessarily more numerous in larger corallites. Minor septa very variably developed, some suppressed and discernible only in the microstructure of the stereozone. Dissepiments normal or in 'herringbone' arrangement where the minor septa are suppressed.

Longitudinal sections with subparallel epitheca and up to 50.0 mm. in length. Stereozone broad, surface rough and enveloped by stromatoporoids in places. The dissepimentarium is generally between one-quarter and one-third the total width of the lumen; dissepiments moderately long and gently curved, peripheral ones commonly coated with, or even embedded in, sclerenchyme. Tabulae broad, but mostly incomplete, sinuous, spaced at 1 to 6, typically 3 or 4, per mm. Trabeculae not well displayed in type material, directed upwards and inwards at an angle of about 26° to the walls of the corallite and very slightly divergent distally.

Remarks. The species is similar to another species of *Alaiophyllum* occurring rarely in the Maligne Formation of the central Alberta Rocky Mountains. It is distinguished by its broader dissepimentarium and narrower tabularium with consistently closer-spaced and less complete tabulae. Further, perhaps less diagnostic, distinctions are that the Alberta specimens have sclerenchyme coating on some of the tabulae as well as the dissepiments and have individual corallites of more variable diameters. Both species almost invariably grew with ectoparasitic stromatoporoids. *A. jarushevskyi* Goryanov has shorter septa and a narrower dissepimentarium than *A. mackenziense*. It also has clearer traces of the septa within the stereozones, but this may be due to differences in preservation.

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EXPLANATION OF PLATE 19

All figures are $\times 4$.

Alaiophyllum mackenziense sp. nov., lower 140 feet of the Kee Scarp Formation at Kee Scarp, 6 miles WNW. of Norman Wells, Northwest Territories, Canada.

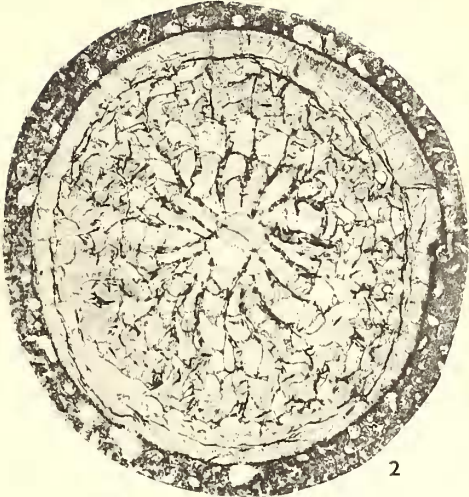
Figs. 1, 2, 6. Holotype, GSC 16850. 1, 6, Longitudinal sections; 2, transverse section.

Figs. 3, 5. Paratype 1, GSC 16851, longitudinal sections.

Fig. 4. Paratype 2, GSC 16852, transverse section.



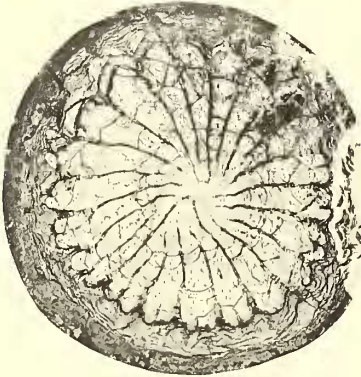
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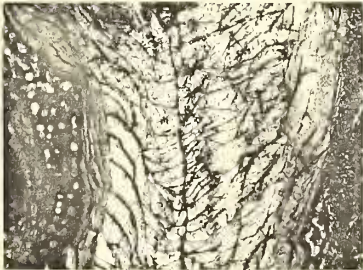
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